NEWS REPORT

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The Atomic Bomb Casualty Commission

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A LITTLE more than a month after the atomic bombing of Hiroshima and Nagasaki, American scientists had begun to examine the effects of the new weapon. A group of physicians, physicists, engineers, photographers, and other specialists surveyed the two areas for residual radiation; studied the effects of fire and blast, and the damage to structures; and of most importance for the present purpose, examined bomb victims, both alive and dead.

This group, known as the Joint Commission for the Investigation of the Effects of the Atomic Bomb in Japan, was composed of units from the United States Army, the Manhattan Engineering District, and the United States Navy, who worked closely with an organization of Japanese scientists from the leading Japanese universities. The cooperation of the Japanese was excellent and extremely valuable, since they had entered the bombed areas and set up their study programs immediately after the explosions.

The observations of the Joint Commission were presented in a 6-volume report, now declassified and familiarly known as the Oughterson report. The medical findings included, of course, only the immediate and early effects—epilation, petechiae, hemorrhage, leucopenia, anemia, burns, keloids, and the like.

The realization had been growing that henceforth all the people of the world, whether engaged in war or peaceful industry, would be potentially subject to exposure and radiation of an intensity never before imagined. There existed a unique reservoir of human beings already exposed in Japan who could be kept under study to learn of the possible late effects of exposure. It is true that many experiments had been made with laboratory animals and that in the course of time much information had been accumulated on the effect of excessive exposure of humans to X-rays, but in these only limited portions of the electromagnetic spectrum had been employed, and the radiation had been relatively slowly applied.

Because of these considerations, it was proposed early in 1946 by the several members of the Joint Commission that a new and permanent commission be established to continue without interruption over a long period of time the observations already begun. A thoroughgoing study of the health of the inhabitants of the two Japanese cities was envisaged with particular attention to leukemia, cancer, genetic changes, reduction in vigor, decreased longevity, increased susceptibility to disease, sterility, alterations in growth and development, and any other changes which

might be observed. The expense and inconvenience of operating in a distant country were fully recognized, as were also the difficulties of evaluating such an uncontrolled mass biological event. This was particularly true with respect to genetic studies in which it was calculated that there was a high probability of obtaining only inconclusive results. But the questions to be answered were of such importance that the effort was considered imperative.

The late effects, although greatly interesting to the military, were beyond the areas of their particular responsibility; therefore, major support had to be provided from another source. The recommendation was made by the Armed Forces that the National Academy of Sciences–National Research Council be directed to undertake the task. This suggestion was approved, and the National Academy was appointed by Presidential directive to assume responsibility for the studies. The Committee on Atomic Casualties was established to furnish scientific advice. Financial support was provided by the Division of Biology and Medicine of the Atomic Energy Commission through a contract with the Academy. The Japanese National Institute of Health also contributed a modest amount of financial help.

The Armed Services continued to participate to the extent that their Institute of Pathology was designated the repository of all material and records accumulated; they freely provided logistic support, supplies, and facilitation and even assigned military personnel in limited numbers to the project.

The Atomic Bomb Casualty Commission (ABCC), consisting of five medical scientists, arrived in Japan in November 1946. Because of the chaotic conditions left by war, continuous observation was begun first at Hiroshima, since this location was less remote from Tokyo and the source of supplies than was Nagasaki. The first laboratory work was done in a railway car; but later space was obtained in the Hiroshima Red Cross Hospital, which had been rehabilitated to a usable degree, and in the Kure Municipal Hospital some nineteen miles away. The latter was chosen as a control post for Hiroshima, then the seat of the local United States Military Government.

The ABCC, being concerned with the health of the Japanese, was attached to the Japanese National Institute of Health, an organization established by the American Occupation Forces and planned roughly on the pattern of the American National Institutes of Health. A Japanese director of the Institute group is included in the administrative staff of the Commission and has been of inestimable service in obtaining the understanding of the cities' inhabitants.

Initially clinical centers were contemplated for the two bombed cities and for two neighboring cities to serve as controls. Interim laboratories were erected at Hiroshima, Nagasaki, and Kure for use while more elaborate, permanent facilities were being constructed; but continually increasing building and operating costs in Japan have prevented the full realization of the original plan. Furthermore, it was found that the inhabitants of Kure, who lived 20 miles away from Hiroshima and who had not suffered the destruction of their city, had little enthusiasm for periodic examinations. Eventually all effort was centered at Hiroshima and Nagasaki with a system of internal control. Unexposed individuals moving into the city at least 30 days after the bombing, or those who had been beyond 3,000 meters at the time of the explosion, are serving as controls. Only one permanent clinic has been erected—that at Hiroshima, which employs approximately forty-five Americans and Australians, and six hundred Japanese. Nagasaki with a much smaller staff remains a location at which special studies may be supplemented.

Once the operation was well established and the major directions of its efforts determined, the policy was adopted of reducing the ratio of American to Japanese staff. Promising young Japanese physicians are employed; and, after a period of training in the methods of medical research, they undertake the examination of their people who feel much more at ease with them than with foreigners. The American

staff maintains a supervisory and teaching function and is responsible to the supporting organizations. This has worked so well that the total American staff now numbers just about sixty, including 15 professional people, whereas the Japanese staff numbers approximately seven hundred with some fifty physicians and perhaps a hundred nurses and technicians.

An attempt is made at least once yearly to reexamine the random samples from intermediate zones, as well as the whole surviving population from the area within 1,000 meters of the point of explosion. The Commission also maintains close rapport with the hospitals, clinics, and physicians of the community. It obtains details on those patients who, regardless of their present ailments, have a history of radiation exposure. In addition, an attempt is made to obtain autopsies of all individuals dying of leukemia in the two cities. In these cases the Commission assists in defraying funeral expenses.

Every effort is made to make the visits by the Japanese pleasant. From the beginning their visits have been entirely voluntary. Subjects are notified beforehand that their participation will be appreciated. At the appointed time a vehicle belonging to the Commission calls for them and returns them after examination so that as little of their time may be taken as possible. If they are found to be in ill health, the subjects are informed, and their physicians are furnished the results of the ABCC examinations and tests. Diagnostic assistance and indicated laboratory work are also made available to the Japanese free of charge for any other cases which the Japanese physicians may refer to the Commission. However, the Commission does not give treatment, as it is not licensed and has no desire to interfere with the livelihood of the Japanese medical profession.

For convenience, a somewhat arbitrary division of effort into three categories—genetics, pediatrics, and adult medicine—has been made, although it was realized that one program developed naturally into the next. The genetics studies proper got underway before the others. After six years of observation and accumulation of data on over 70,000 children born of parents, one, both, or neither of whom were exposed, it was found on preliminary analysis that further numbers would contribute little to the significance of the observations. Accordingly, during full and final analysis this activity has been discontinued except for observation of the sex ratio of births. A statement of the results of the genetics program is premature, but it is encouraging to report that exceedingly little of a deleterious nature has been found.[1]

Damage to the unborn fetus is evidently usually accompanied by a loss of viability, with the result that infants with major congenital defects or disturbances are rarely seen. Damage to developing teeth, although not a major finding, is probably of statistical significance. The studies of growth and development have failed to show as much as might have been expected. Some retardation in growth was found at first, but a strong tendency toward recovery has been evident over the past several years, beyond what would be expected from the resumption of a more plentiful and normal mode of life.

Two ailments in particular have been found due to exposure to radiation which are of a serious nature—cataracts and leukemia. When cataracts were observed here among cyclotron physicists, an intensive search for a corresponding effect was made in Japan. Altogether approximately 150 cases have been found at present, but very few are severe enough to interfere with vision, and in many cases the subject is not aware of their existence. Again, they do not seem to be progressive at present, or at least progression is extremely slow. The relative meagerness of the damage can be realized from the fact that only five cases so far have required operation. This is encouraging when it is remembered that several hundred thousand individuals were present in the two cities at the time of the bombings.

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[1] NEEL, J. V., SCHULL, W. J., MCDONALD, D. J., MORTON, N. E., KODANI, M., TAKESHIMA, K., ANDERSON, R. C., et al. THE EFFECT OF EXPOSURE TO THE ATOMIC BOMBS ON PREGNANCY TERMINATION IN HIROSHIMA AND NAGASAKI: PRELIMINARY REPORT. Science 118: 537–541, 1953.

More serious is the appearance of leukemia among the exposed. A number of cases are known, and the incidence increases with the amount of radiation received. But the disease also has been found in the non-exposed control population, and the picture is complicated by the fact that no accurate information has been available of the normal incidence among Japanese. In summary, even though the over-all incidence has increased, it is still a rare disease.

Other possible effects of the bombs have been looked into. Sterility was found not to be a major problem. Evidence of shortened lifespan, decreased physical vigor, heightened incidence of other neoplasms, and so on, has been sought, but the results are as yet unconvincing.

The Commission, despite the preponderantly negative results, expects to continue its efforts for a number of years, since other delayed effects—if they do finally appear—must not be missed. Further, a well established negative result would be extremely important. Meanwhile, studies of other conditions not related to the explosions are carried on as they are brought to light during the daily routine. These have already provided interesting and valuable information on human physiology and on the pathology of the Japanese.

SCIENCE NEWS

ANNUAL MEETING

NATIONAL ACADEMY OF SCIENCES

The ninety-first annual meeting of the National Academy of Sciences took place in Washington, April 26–28, with approximately two hundred and twenty members of the Academy in attendance. Eight public scientific sessions on Monday, April 26, and Wednesday, April 28, included more than forty contributed papers and three symposia of invited papers on topics of current scientific interest. The Academy met in business session on Tuesday, April 27.

The Academy's guest-of-honor this year was Per Adolph Geijer, President of the Royal Swedish Academy of Science, who gave the principal address at the dinner on Tuesday evening. Professor Geijer described the history of the Swedish Academy since its founding more than two hundred years ago and presented warm greetings from the scientists of Sweden to the scientists of the United States. His visit continued the Academy's custom, started two years ago, of inviting the president of a sister academy abroad to participate in the annual meetings. Guests-of-honor of the past two years have been E. D. Adrian, President of the Royal Society of London, and A. J. Kluyver, President of the Royal Netherlands Academy of Science.

Edwin H. Land, a member of the Academy and President of the American Academy of Arts and Sciences, was also a special guest at dinner. He spoke of the kinship between the American Academy and its "younger sister," the National Academy, and of the particular responsibility that the American Academy feels, because it includes the Arts as well as the Sciences, for exerting its influence toward increasing understanding and sympathy between these great realms of intellectual endeavor. Other speakers at the dinner were Ross G. Harrison, observing the forty-first anniversary of his election to the Academy; and, as guests of the Academy from abroad, Alexander R. Todd of Cambridge University and Eduardo Amaldi of the University of Rome, who graciously expressed their satisfaction at the opportunity to take part in the meetings and brought greetings from the Royal Society of London and the Accademia Nazionale dei Lincei, respectively.

On Monday, April 26, besides three sessions of contributed papers, a symposium on "The Structure and Function of Nucleic Acids" was held under the chairmanship of

Linus Pauling. Six invited papers summarizing the status and prospects of research on nucleic acids from the chemical, biological, and physiological standpoints made up this symposium. Professor Todd, who had come from Cambridge University for the occasion, participated in the symposium with a paper on the organic chemistry of the nucleic acids.

Two Academy medals and one prize were awarded in an evening ceremony on Monday. Vannevar Bush received the John J. Carty Medal which is awarded by the Academy at intervals for "noteworthy and distinguished accomplishments in any field of science coming within the scope and charter of the Academy." Citing Dr. Bush's many and varied contributions to science, the award committee summarized his accomplishments with the words: "Very few men in the history of our country have exerted so profound and so diversified an influence on science and its ramifications in our society. . . . " The Daniel Giraud Elliot Medal for "the most meritorious work in zoology or paleontology published each year" went to Raymond C. Osburn in recognition of his comprehensive treatise on "Bryozoa of the Pacific Coast of America." William Shockley received the Cyrus B. Comstock prize, awarded every five years for "advancement of knowledge in electricity, magnetism, and radiant energy," for his pioneering work on the electric and magnetic properties of solid materials, and in particular for his researches on the conduction of electricity in semi-conductors. Each of the recipients responded with a brief address on his scientific work.

A reception followed the presentations on Monday evening. During the reception, scientific demonstrations and exhibits were on view in the library and reading room of the Academy building. These were made possible by the cooperation of individual scientists, industrial concerns, and other institutions, who together provided over twenty exhibits of new discoveries and recently developed instruments and experimental techniques.

Four scientific sessions on Wednesday, April 28, included two invited symposia. Under the chairmanship of I. I. Rabi, the first included three papers on various aspects of the "Development and Significance of High-Energy Particle Accelerators for Nuclear Research." Leland J. Haworth described the design and performance features of various types of particle accelerator, and Hans A. Bethe discussed the significance of results so far obtained and of some that may be anticipated in the future. The program of nuclear particle research in Europe, particularly that associated with the European Council for Nuclear Research (CERN), was summarized by Eduardo Amaldi, Professor of Experimental Physics at the University of Rome and Secretary-General of CERN.

The second symposium on Wednesday, under the chairmanship of Lloyd V. Berkner, included nine papers on "Scientific Aspects of the International Geophysical Year," presenting the major scientific problems that will be the subject of concerted attack by scientists of many nations in the coordinated world-wide efforts being planned for 1957–58.

In the business session on Tuesday afternoon the Academy reviewed events of the past year related to the conduct and role of science and examined problems of the present. Many matters and issues concerning the wholesome development of science and the relations of scientists to their government were seriously deliberated and soberly discussed. The actions of the Officers and Council of the Academy in emphasizing conditions essential to the freedom of science and its furtherance were commended. They were encouraged to continue and extend their efforts in developing a better climate for scientific investigation and the better use of science in the development of human welfare and the welfare of our nation. Means were discussed for achieving wiser and more considerate procedures involving the support and utilization of scientists in those operations of government where scientific investigation and advice are required.

During the business sessions on Tuesday, lady guests of Academy members visited some of the historic homes and gardens of Maryland on the shore of the Chesapeake.

ELECTION OF OFFICERS AND MEMBERS NATIONAL ACADEMY OF SCIENCES

At the annual business meeting of the Academy on April 27, Detlev W. Bronk, President of the Rockefeller Institute for Medical Research, was re-elected President of the Academy for a four-year term, and John G. Kirkwood, Sterling Professor of Chemistry at Yale University, was elected Foreign Secretary for a four-year term also. Farrington Daniels, Professor of Chemistry at the University of Wisconsin, and Merle A. Tuve, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, were named to three-year terms on the Council of the Academy. Dr. Daniels and Dr. Tuve will replace Jesse W. Beams, University of Virginia, and Edwin C. Stakman, University of Minnesota, who will complete their three-year terms on the Council on June 30, 1954.

The following members and foreign associates were elected to the Academy:

New Members of the Academy

EDGAR ANDERSON, Professor of Botany, Washington University.

HORACE WELCOME BABCOCK, Astronomer, Mount Wilson Observatory.

EDGAR COLLINS BAIN, Vice President in charge of Research and Technology, United States Steel Corporation, Pittsburgh, Pa.

ARNOLD KENT BALL, Professor of Enzyme Chemistry, Purdue University.

JOHN BARDEEN, Professor of Physics and Electrical Engineering, University of Illinois.

WILLIAM BLOOM, Professor of Anatomy, University of Chicago.

MILTON NUNN BRAMLETTE, Geologist, Scripps Institution of Oceanography.

WALLACE REED BRODE, Associate Director, National Bureau of Standards.

MELVIN CALVIN, Professor of Chemistry, University of California at Berkeley.

BRITTON CHANCE, Director, Johnson Foundation, University of Pennsylvania.

RICHARD PHILLIPS FEYNMAN, Professor of Theoretical Physics, California Institute of Technology.

HERMANN OTTO LAURENZ FISCHER, Professor of Biochemistry, University of California at Berkeley.

JAMES BROWN FISK, Director of Research in the Physical Sciences, Bell Telephone Laboratories, Murray Hill, N. J.

JOY PAUL GUILFORD, Professor of Psychology, University of Southern California.

NATHAN JACOBSON, Professor of Mathematics, Yale University.

GEORGE ELBERT KIMBALL, Professor of Chemistry, Columbia University.

WILLIS EUGENE LAMB, Professor of Physics, Stanford University.

EUGENE MARKLEY LANDIS, Professor of Physiology, Harvard Medical School.

ERNST MAYR, Professor of Zoology, Harvard University.

WILLIAM FREDERICK MEGGERS, Chief, Spectroscopy Section, National Bureau of Standards.

ALFRED EZRA MIRSKY, Member, Rockefeller Institute for Medical Research, New York City.

BRIAN O'BRIEN, Vice President, American Optical Company, Southbridge, Mass.

WOLFGANG K. H. PANOFSKY, Professor of Physics, Stanford University.

ALEXANDER PETRUNKEVITCH, Professor Emeritus of Zoology, Yale University.

ARNOLD RICE RICH, Professor of Pathology, School of Medicine, Johns Hopkins University.

JULIAN HAYNES STEWARD, Professor of Anthropology, University of Illinois.

ERNEST HARRY VESTINE, Department of Terrestrial Magnetism, Carnegie Institution of Washington.

FRANK HENRY WESTHEIMER, Professor of Chemistry, University of Chicago.

RALPH HARTLEY WETMORE, Professor of Botany, Harvard University.

ALBERT EDWARD WHITFORD, Professor and Director, Washburn Observatory, University of Wisconsin.

Foreign Associates

SIR MACFARLANE BURNET, Director of the Walter and Eliza Hall Institute for Medical Research, Melbourne, Australia.

ALBERT M. G. R. PORTEVIN, Consulting Engineer, Paris, France.

OTTO RENNER, Professor and Head, Botanical Institute and Garden, Munich, Germany.

STAFF APPOINTMENT DIVISION OF CHEMISTRY AND CHEMICAL TECHNOLOGY

Leason H. Adams has been appointed Executive Officer of the Division of Chemistry and Chemical Technology on a part-time basis beginning May 1, 1954.

Dr. Adams received a B.S. degree in chemical engineering from the University of Illinois in 1906 and his Sc.D. degree from Tufts College in 1941. Having started in the field of analytical chemistry, he turned first to physical chemistry through an appointment with the then newly established Technologic Branch of the United States Geological Survey and then to geophysics and experimental petrology through his work at the Geophysical Laboratory of

the Carnegie Institution of Washington. He served as Director of the Laboratory from 1937 until his official retirement in 1952. Of late years, Dr. Adams' primary interest has been the properties of rocks and minerals under extreme pressures and, more especially, in the way that these bear upon the chemical and physical properties of the earth's deep interior.

As evidence of his duality of interests, Dr. Adams has, on the one hand, served as a director of the American Chemical Society and as chairman of the Washington Chemical Society and, on the other hand, as President of the American Geophysical Union and President of the Geological Society of Washington. He is a member of the National Academy of Sciences and of numerous scientific societies. He has received the Longstreth Medal from the Franklin Institute, the Bowie Medal from the American Geophysical Union, and the Medal for Merit from the United States Government.

CONFERENCE ON RADIATION CATARACTS

The Committee on Radiation Cataracts held its fifth annual conference on March 26. Established by the Division of Medical Sciences at the request of the Atomic Energy Commission following the discovery that certain physicists exposed to neutron beams had developed cataracts, the Committee has been engaged in studying these cases and in furthering research on this phenomenon.

At this meeting, considerable advances were reported in the quantitation of radiobiological effects. Clinical studies in Japan have shown that the development of subcapsular plaques was correlated with the degree of exposure to atomic radiation, and also with age in the non-exposed population. Among the finds through animal experimentation was the induction of neoplasia in the Harderian glands of CF_1 mice by irradiation. An example of the complexities encountered in studying the mechanism of radiation effects was provided by a report describing the multiplicity of changes which may occur even in a single short-chain amino acid.

SECOND HIGHWAY SAFETY RESEARCH CONFERENCE

With the advice and cooperation of the Academy–Research Council Divisions of Medical Sciences, Anthropology and Psychology, and Engineering and Industrial Research, the "Council-wide" Committee on Highway Safety Research on April 5 and 6 sponsored a Conference on Health, Medical, and Drug Factors in Highway Safety. A total of 69 invited experts attended—45 in the fields of public health; epidemiology and preventive medicine; pharmacology; biochemistry; pathology; physiology and other medical specialties; physical and cultural anthropology; and physiological and experimental psychology. The other 24 experts represented the fields of instruments, fuel, vehicle and traffic engineering, safety and motor vehicle administration, accident and enforcement research, and other traffic specialties.

Harold V. Gaskill, Dean of the Division of Science, Iowa State College, and Chairman of the Committee on Highway Safety Research, presided over the first and final sessions. The Chairman of the National Research Council, William W. Rubey, in a welcoming talk briefly reviewed the formation of the Committee. He pointed out the need for correlating and stimulating research on highway safety and noted the wide range of specialized talent and experience represented by the conference participants.

The purpose of the conference was to bring together selected traffic specialists and scientists from different fields of physical and biological science to report on research results and to advise on needed research. This conference dealt with a more limited area than the first conference sponsored by the Committee in 1952 which advised on the whole field.

At the first session of the Conference on Health, Medical, and Drug Factors, questions were raised by traffic engineers and administrators on problems in this area needing practical answers. The subjects and chairmen of the next four sessions were as follows: *1*) Health and self-medication factors as traffic accident causes, George James, New York State Department of

Health; 2) diabetes, epilepsy, heart attacks, and convulsive therapy on an ambulatory basis as possible traffic accident causes, Halbert L. Dunn, United States Public Health Service; 3) fatigue, low oxygen, and combustion products as traffic accident causes, David Dill, Army Chemical Center; and 4) blood alcohol level and extent of traffic accident hazard, Nathan B. Eddy, National Institutes of Health. The 18 papers and prepared discussions were supplemented at each session by discussion from the floor.

In addition, the group divided into four working subgroups so that each could discuss the types of information and research needed on one of the session topics listed above. Recommendations on research needs were presented to the entire conference for discussion and clarification. A report of the conference, including both the program material and the final recommendations, will be circulated to the participants for review and revision. The final report will be available in limited numbers to research scientists and those interested in highway safety research.

WALTER H. ROOT

Walter H. Root, Chairman of the Executive Committee of the Highway Research Board, died on April 28, 1954. His death brought to a close 33 years of continuous service with this organization. Starting as Chairman of the Committee on Highway Maintenance first organized in 1921, he remained a member of the Committee until 1938 when he was elected Chairman of the Department of Maintenance, a position in which he ably served until his appointment to the Executive Committee in 1950. In 1952 and 1953 he served as Vice Chairman of the Executive Committee and on January 15, 1954, was elected Chairman. His last official duty in this position was that of conducting a meeting of the Department Chairmen and staff at the Academy–Research Council on March 31.

Mr. Root was succeeded as Chairman of the Executive Committee by G. Donald Kennedy, Vice President of the Portland Cement Association.

COMMITTEE ON URBANIZATION RESEARCH

At a preliminary discussion meeting on urbanization research held on March 5 under the auspices of the Academy–Research Council, the Highway Research Board was authorized to proceed with the urban research problem with the assurance of cooperation from the other divisions of the Research Council. Pursuant to this authorization, the Highway Research Board established a special committee in April to work on urban research.

The ad hoc Committee on Urbanization Research thus appointed by the Board held its initial meeting at the Academy–Research Council on April 22 and 23. Composed of individuals from universities, the Federal Government, and national agencies, this meeting drew together representatives of the various scientific disciplines interested in research on urban development and transportation. The purpose of the meeting was to discuss the scope of the problem to be attacked, research done, research needed, assignment of projects, and the need for a continuing correlation of research activities.

The consensus was that the immediate research program be directed toward an understanding of the relations of urban functioning and transportation. Among the various research needs discussed were the following: *1*) motivations of movement of people and goods as related to trip, change of domicile, or relocation of establishment; 2) response to change or adjustment in transportation, whether economic, physical, mode of transportation, time of travel, terminal facility, or other relevant factors; 3) interrelations of transportation and social and economic conditions, or interrelation of transportation and urban development; 4) effect of building expressways on social and economic values of the adjacent areas and total community; 5) effect of attitude toward transport media and traffic condition on choice or usage; 6) management of traffic movement through police power and local legal tools; 7) economic and administrative interrelations of various modes of transportation and terminal facilities; 8) study of integration of

administration of various modes of transportation and terminal facilities; *9*) travel patterns in relation to character of land use and in terms of community characteristics and season of year; *10*) daytime population in the central business district and other significant areas; *11*) relative attraction of various types of travel routes and establishments in terms of traffic diversion and generation; *12*) method of keeping transportation studies current and forecasting traffic needs and traffic patterns; *13*) determination of priorities in construction of parts of the transportation system; and *14*) technological trends in transportation.

The Committee concluded that it would be desirable for an agency such as the Academy–Research Council to act as a national repository and clearinghouse for urbanization research and made the following recommendations: *1*) that an Advisory Committee be established to deal with the problems of urban functioning as related to transportation; 2) that a staff be provided to serve the Advisory Committee; and 3) that periodic meetings be held in the form of discussion forums and symposia to provide interchange of views and information.

NEW BROCHURE ON PREVENTION OF DETERIORATION CENTER

Prevention of Deterioration Center—A Service for the Department of Defense is the title of the new brochure recently issued by the Prevention of Deterioration Center, Division of Chemistry and Chemical Technology. Designed to supplant the so-called "Red Book" of June 1949, this 20-page booklet outlines the deterioration problem in its broad aspects, traces the history, origin, and organization of the Prevention of Deterioration Center, and describes present services and professional activities of this Academy–Research Council group.

Interested persons in and out of the Federal Government may obtain a copy free from the Prevention of Deterioration Center, 2101 Constitution Avenue, Washington 25, D. C.

MATERIALS ADVISORY BOARD

In connection with the reorganization of the research and development activities of the Department of Defense, Donald A. Quarles, Assistant Secretary of Defense (Research and Development), requested the Academy–Research Council to expand the scope of its advisory activities on metals and minerals to include advisory services in the whole field of engineering materials. In order to do this effectively, the Minerals and Metals Advisory Board has been reconstituted as the Materials Advisory Board. John R. Townsend, Director of Material and Standards Engineering, Sandia Corporation, has agreed to serve as Chairman of the new Board, and Francis C. Frary, Technical Advisor, Aluminum Company of America, will serve as Vice Chairman.

The new Board continues the services of the Metallurgical Advisory Board, organized early in 1951 with Robert F. Mehl as Chairman, and its successor, the Minerals and Metals Advisory Board with F. C. Frary as Chairman. The program of the Board is supported by contracts between the Academy–Research Council and the Department of Defense and General Services Administration. This dual support enables the Board to undertake assignments concerned with the technical problems involved in the production of minerals and metals, as well as those involved in the development and use of materials by the Armed Services.

Members of the Board are:

JOHN R. TOWNSEND, Sandia Corporation, *Chairman*
FRANCIS C. FRARY, Aluminum Company of America, *Vice Chairman*
E. C. BAIN, United States Steel Company
E. K. BOLTON, E. I. du Pont de Nemours & Co.
S. M. CADWELL, United States Rubber Company
JOHN CHIPMAN, Massachusetts Institute of Technology
JAMES H. CRITCHETT, Union Carbide & Carbon Research Laboratories
ALVIN J. HERZIG, Climas Molybdenum Company of Michigan
MATTHEW A. HUNTER, Rensselaer Polytechnic Institute
ZAY JEFFRIES, General Electric Company
WALTER E. JOMINY, Chrysler Corporation
C. K. LEITH, University of Wisconsin
D. H. MCLAUGHLIN, Homestake Mining Company

LORRAIN J. MARKWARDT, Forest Products Laboratory
C. S. MARVEL, University of Illinois
ROBERT F. MEHL, Carnegie Institute of Technology
H. J. OSTERHOF, Goodyear Tire & Rubber Company
ALBERT J. PHILLIPS, American Smelting & Refining Company
OLIVER C. RALSTON, United States Bureau of Mines
CYRIL S. SMITH, University of Chicago
E. C. SMITH, Republic Steel Corporation
JOHN G. THOMPSON, National Bureau of Standards
HANS THURNAUER, American Lava Corporation
WALTER C. VOSS, Consultant, Architectural Construction and Materials
CLYDE WILLIAMS, Battelle Memorial Institute
VERNE H. SCHNEE, *Executive Director*

DISASTER RESEARCH NEWSLETTER

The Committee on Disaster Studies of the Academy–National Research Council published its first issue of the *Disaster Research Newsletter* in March 1954. Disaster research has needed a medium through which investigators in the field might learn of current disaster research and of other personnel engaged in the study of disaster phenomena. Because of the multi-discipline approach to such study, it is hoped that the *Newsletter* may serve as liaison to investigators in the various scientific, administrative, and organizational fields, and that it will stimulate an exchange of information among investigators.

Individuals or institutions engaged in basic or applied research, the administration or organization pertinent to disaster study, or in the planning or relief of disaster problems, may obtain the *Newsletter* free from the Committee on Disaster Studies, 2101 Constitution Avenue, Washington 25, D. C.

CANADIAN–UNITED STATES CONFERENCE ON HEPARIN

On April 21, the Panel on Blood Coagulation and the Panel on Coagulants and Anti-coagulants of the Defense Research Board of Canada held a joint meeting in Toronto. The subject of this meeting was the status of research on heparin, an anticoagulant used therapeutically to prevent the formation of blood clots following cardiovascular surgery and in thrombotic diseases.

As in other aspects of the national blood program, exchange of information and personal liaison with Canadian scientists has been in effect for several years. This conference, however, marked the first time that the corresponding committees of the two nations have met together to discuss their common problems, and the occasion symbolized the closer relationships that are being established with Canada throughout the spectrum of medical activities.

PACIFIC ATOLL RESEARCH

In early June a 6-man team leaves California for a week of briefing in Honolulu prior to a two-month field study of Kapingamarangi, a small oceanic atoll in the Southern Carolines of the Trust Territory about two degrees north of the Equator. This study is a continuation of the 5-year coral atoll research program of the Pacific Science Board of the Academy–Research Council. It is supported by the Office of Naval Research, with assistance on fish studies from the George Vanderbilt Foundation.

The field work will parallel the pattern of ecological investigations already made of the atolls of Arno in the Marshalls, Onotoa in the Gilberts, Raroia in the Tuamotus, and Ifaluk in the Western Carolines. The results of this program in basic research will be correlated with other atoll research throughout the Pacific, particularly the work at Bikini, Eniwetok, and the current studies of the United States Geological Survey.

Kapingamarangi is a small remote atoll inhabited by about 500 Polynesian people. It was studied in 1947, under another Pacific Science Board project by a Bishop Museum anthropological expedition under the leadership of the late Sir Peter Buck, Director of the Museum. Kenneth P. Emory also of the Museum staff and a member of the 1947 expedition revisited the atoll in 1950 with Ralph E. Miller of Dartmouth College to carry out further studies of the people and their health.

The leader of this year's team will be Edwin D. McKee, geologist from the United States Geological Survey at Denver, Colo. Other members of the team will be

Cadet H. Hand, Jr., marine biologist from the University of California; Robert R. Harry, Jr., ichthyologist from the Philadelphia Academy of Natural Sciences; W. Jan Newhouse, algologist from the University of Hawaii; William A. Niering, land ecologist from Connecticut College; and Herold J. Wiens, geographer from Yale University.

The primary mission of the research team will be to make a detailed study of the natural environment of the atoll, including the geology and biology. The group will study the interrelationships of plant and animal life, which appears to have had little dependence on contacts with outside islands.

INTERNATIONAL UNION FOR THE PROTECTION OF NATURE

The Fourth General Assembly of the International Union for the Protection of Nature will be held at Copenhagen from August 25–September 5, 1954. Participating governments and member organizations are being invited to send delegates. The National Research Council will be represented by Harold J. Coolidge, Executive Director of the Pacific Science Board and a Vice-president of the union. Mr. Coolidge is being sent to the Assembly by the American Committee for International Wild Life Protection. The United States will be represented by delegates from twenty-one national organizations that hold membership in the Union and by observers from appropriate Government agencies as well as other organizations concerned with international protection of nature.

In addition to the statutory meetings and field excursions to southern Sjælland, the island of Lolland and to Jutland, technical meetings will be held during the Assembly on the following subjects: protection of arctic fauna; the effects of modern insecticides on mammals, birds, and insects; and various methods and means of publicity for nature protection. The organization of the Assembly in Copenhagen is being handled by the Danish Naturfredningsraadet at Sortedam Dossering 23, Copenhagen N.

ANNUAL MEETING AMERICAN GEOPHYSICAL UNION

The thirty-fifth annual meeting of the American Geophysical Union was held in Washington, May 3–5, with more than 1,000 in attendance. The program included 120 scientific papers, numerous reports, several panel discussions, and a session of documentary films in oceanography.

One of the highlights of the meeting was the award of the William Bowie Medal to Richard Montgomery Field, President of the Union from 1938 to 1941. Dr. Field was the sixteenth recipient. His faculty for pointing out geophysical problems susceptible of productive work and getting people to work on these problems marked an important era in the American Geophysical Union during the late thirties and early forties. Preceding the medal award, Joseph Kaplan of the University of California outlined the plans for the International Geophysical Year to be held in 1957–58, and William C. Krumbein of Northwestern University spoke on "Applications of Statistics in the Earth Sciences."

The General Assembly on Wednesday afternoon included a Symposium on Geophysical Models and a brief business meeting. Eight resolutions were adopted and the dates for the thirty-sixth annual meeting were set for May 2–4, 1955.

NORMAN P. MASON RECEIVES PRESIDENTIAL APPOINTMENT

Norman P. Mason, President of the Building Research Institute and a member of the Building Research Advisory Board, was named Acting Commissioner of the Federal Housing Administration by President Eisenhower on April 13.

Mr. Mason was appointed to the Building Research Advisory Board in 1950 and became a member of its Executive Committee. He was also the first President of the Institute. Although primarily a businessman, he fully realized that progress in business was closely allied to dynamic research programs. He was instrumental in making men in the building industry aware of research activities coordinated by the Institute and by the Building Research Advisory Board.

AMERICAN GEOLOGICAL INSTITUTE

A *Directory of Geologists and Exploration Geophysicists* belonging to the member societies of the American Geological Institute was issued by the Institute in April. Approximately 20,000 names and addresses are listed in the Directory, which is a by-product of the work on the Earth Sciences Section of the National Register of Scientific and Technical Personnel carried out by the Institute in cooperation with the National Science Foundation. The volume is mimeographed and sells for $2.50 in the United States, Canada, and Mexico.

Beginning in May the Institute's *Newsletter* will become an 8-page, 3-column newspaper. Starting with the September issue, the *Newsletter* will be mailed to everyone whose name and address appears in the Earth Sciences Section of the National Register.

PROBLEMS OF COMMUNICATION AND STORAGE IN THE EARTH SCIENCES

A feature of the annual meeting of the Division of Earth Sciences held in Washington, April 30 and May 1, was a conference on "Problems of Communication and Storage of Information in the Earth Sciences" under the chairmanship of Francis Birch, Chairman of the Division. No formal program was announced for the conference, but speakers were alerted in advance to be prepared to make brief remarks on specific aspects of the conference topic.

Henry R. Aldrich, Geological Society of America, spoke on some of the penalties and premiums stemming from the quantity of publications in relation to quality and the need for an earlier enlightenment of the students who will become producers of papers. Ralph Shaw, United States Department of Agriculture, described an electronic selector and pointed out the need for knowing what is wanted before mechanical selection can be made. Arch C. Gerlach, Library of Congress, discussed problems of map storage, cataloging, indexing, and preparation. Robert Balk, New Mexico Bureau of Mines and Mineral Resources, spoke from the viewpoint of one geologist who is both producer and consumer of published articles. J. T. Singewald, Jr., Maryland Geological Survey, commented on some of the publication problems faced by state geological surveys; and M. King Hubbert, Shell Oil Company, reviewed the quantities and types of geological and geophysical data acquired by oil companies, the present availability of the data, and the possible impact on science if all of it were made available at once.

After each talk there was extensive discussion by the more than fifty earth scientists present. Among the problems reviewed were open-file publication, release and exchange of unpublished data, editorial philosophy and policy, storage and cataloging of maps, indexing and coding scientific literature, and abstracts and abstract journals.

PROPAGATION AND DETECTION OF HEPATITIS VIRUS

Since the high incidence of homologous serum hepatitis in the Korean campaign pointed up the failure of ultraviolet irradiation to sterilize plasma, the search for means of eradicating the virus has been intensified. No completely satisfactory alternative for plasma is available. Serum albumin, though safe, is costly and less plentiful; and, while the synthetic substitutes will restore blood volume, they do not replace the vital proteins lost through hemorrhage.

Research on methods of sterilization has been greatly hampered because there are no laboratory methods by which the presence of the virus in blood or plasma can be determined. Each experiment requires the use of human volunteers.

In order to make a frontal attack on this key problem, a Symposium on the Laboratory Propagation and Detection of the Agent of Hepatitis was held in New York City on March 31 under the joint auspices of the Panel on Sterilization of Blood and Plasma of the Division of Medical Sciences and the Commission on Viral and Rick-

settsial Diseases of the Armed Forces Epidemiological Board. Past research was reviewed to determine whether any experimental animals which might prove useful had been overlooked, and other laboratory methods of potential value in the propagation and detection of the virus were discussed. Many interesting leads were developed, and the proceedings of the symposium will be widely disseminated in the hope of encouraging further investigations of this baffling problem.

FELLOWSHIP PROGRAMS

FELLOWSHIP TAXATION

The United States Congress is in the process of rewriting the Internal Revenue Code. The House of Representatives has passed its version, and the Senate Finance Committee is now considering the measure.

The House bill contains a section (117) relating to scholarships and fellowships which is a departure from past practice in that no specific mention of such grants was included in the earlier code. Section 117 specifically excludes from gross income scholarship or fellowship grants with exceptions, however, for persons not candidates for degrees. Section 117 (b) (2) in the House version excepts grants aggregating more than 75 percent of the previous twelve months' income of the recipient. This would make most postdoctoral fellowships taxable.

Following a meeting of representatives of the major interested groups—foundations, research councils, universities, Federal agencies, industries, and the American Cancer Society—at the Academy–Research Council, counter proposals have been made which seem likely to be adopted. Certain criteria for bona fide fellowships were proposed. Additional limitations have been proposed by the officials of the United States Treasury Department which would limit the amounts of such grants, deductible from gross income, to reasonable levels and would limit the aggregate time of postdoctoral fellowships granted any individual to prevent long continued fellowship status.

The Senate Finance Committee has not acted finally on this matter, but appears disposed to write into the Internal Revenue Code language that will establish more clearly the tax-free status of worthy fellowships.

FELLOWSHIPS IN ELECTRONICS

The Fellowship Office of the National Academy of Sciences–National Research Council has announced the award of four predoctoral fellowships in electronics for the academic year 1954–55. These fellowships are supported by the Radio Corporation of America.

The following list of appointees indicates the institution from which the recipient received his degree and the nature and location of his fellowship research:

John Richards Johnson (B.S., Purdue University, 1949)
Determination of optical constants of semiconductors by reflection—University of Pennsylvania, with P. H. Miller, Jr.

John Nazarian Pike (A.B., Princeton University, 1951)
Photoconductivity of cadmium sulphide at low temperatures—University of Rochester, with David Dutton.

Roderic Eadmund Steele (M.S., Stanford University, 1953)
Biological effectiveness of high energy electrons and X-rays produced by a 6Mev linear electron accelerator—Stanford University, with Edward L. Ginzton.

Robert Kirk Whitford (M.S., Purdue University, 1953)
Synthesis techniques for optimum filtering in sampled data systems containing non-linearities —Purdue University, with John W. Truxal.

FELLOWSHIPS IN THE NATURAL SCIENCES

Twelve postdoctoral fellowships in the natural sciences, two of which are renewals, have been awarded for 1954–55. These fellowships are supported by the Rockefeller Foundation, Merck and Company, Inc., and the Lilly Research Laboratories and administered by the National Academy of Sciences–National Research Council. The following list indicates the institution from which the recipient received his degree as well as the nature and location of his fellowship research:

National Research Council Postdoctoral Fellows Supported by Rockefeller Foundation

Richard Charles Blanchfield (to receive Ph.D. in June, 1954, Princeton University)
The knot theory in 3-manifolds–Massachusetts Institute of Technology, with Witold Hurewicz.

Charles Whittlesey Curtis (Ph.D., Yale University, 1951)
The ideal theory in non-commutative rings and the theory of representations of algebraic systems–Institute for Advanced Study, with Deane Montgomery.

Theodore Delevoryas (to receive Ph.D. in June, 1954, University of Illinois)
Study of the morphology and evolution of the Pteridosperms–University of Michigan, with Chester A. Arnold.

Frank Slagle Ham (to receive Ph.D. in June, 1954, Harvard University)
Energy bands of alkali metals and theoretical problems in the area of ionic crystals and semiconductors–University of Illinois, with J. Bardeen.

James Briggs Hendrickson (to receive Ph.D. in June, 1954, Harvard University)
Elucidation of the structures of cucumin and leptodermin–Birbeck College, University of London, with D. H. R. Barton.

Norman Edgar Phillips (to receive Ph.D. in summer 1954, University of Chicago)
Heat capacities of some superconductors with low transition temperatures–University of California at Berkeley, with K. S. Pitzer.

Merck Senior Postdoctoral Fellows

Edward William Fager (Ph.D., Yale University, 1942)
Quantitative study of the succession of animal communities in logs–Bureau of Animal Population, Oxford University, England, with Charles Elton (renewal).

Florence Moog (Ph.D., Columbia University, 1944)
The influence of adrenocortical hormones on juvenile development of the mouse with special reference to the functional differentiation of the small intestine–Molteno Institute, Cambridge University, England, with T. Mann.

Carl Mantle Stevens (Ph.D., University of Illinois, 1941)
Nucleic acid metabolism in neurosposa–California Institute of Technology, with G. W. Beadle and H. K. Mitchell.

Lilly Postdoctoral Fellowships

Sterling Gaylen Bradley (to receive Ph.D. in June, 1954, Northwestern University)
Genetic studies with the actinomycetes–University of Wisconsin, with J. Lederberg.

Thomas Charles Bruice (to receive Ph.D. in June, 1954, University of Southern California)
Studies of model peptidases–University of California at Los Angeles, with T. A. Geissman.

Duant T. Gish (Ph.D., University of California, 1953)
Synthesis of beef vassopressin, an arginine octapeptide amide, and the preparation of various isomers of the hormone and of smaller peptides related to the hormones for testing as to biological activity–Cornell University Medical College, with Vincent du Vigneaud (renewal).

FELLOWSHIPS IN THE MEDICAL SCIENCES

The Medical Fellowship Board of the Division of Medical Sciences has administered postdoctoral fellowships in the medical sciences for The Rockefeller Foundation for thirty-two years. Four years ago the National Tuberculosis Association initiated a series of fellowships in tuberculosis, and three years ago the program of the Board was augmented by a grant from the Lilly Research Laboratories.

At the annual meeting of the Board in March, 1954, eleven appointments were made for the academic year 1954–55. The following list indicates the institution from which the recipients received the doctorate, as well as the nature and location of their fellowship research:

Fellowships in the Medical Sciences Administered for The Rockefeller Foundation

Jack Barrow (M.D., Washington University Medical School, St. Louis, 1946)
The relationship between bacterial and/or capsular water content and rate of phagocytosis–Washington University, St. Louis, with W. Barry Wood, Jr.

Sheldon B. Gertner (Ph.D., Yale University, 1953)
The release of chemical transmitters during nerve stimulation. The mechanisms concerned in the failure of transmission during prolonged stimulation, particularly of adrenergic nerves–National Institute for Medical Research, London, with William Feldberg.

John H. Luft (M.D., University of Washington, Seattle, 1953)
The morphology and histochemistry of the electric organ of the eel (*E. electricus*), and its comparison with striated muscle—Harvard Medical School, with George B. Wislocki.

Sholem Postel (M.D., University of Illinois, 1950)
Detection, isolation, and physiology of thyroid stimulating hormone in body fluids—Massachusetts General Hospital, with John B. Stanbury.

Jonathan G. Wegener (Ph.D., Candidate, University of Chicago, 1954)
Some integrative functions of the cerebral cortex—Institute of Living, Hartford, Conn., with Karl H. Pribram.

Fellowships in the Medical Sciences Administered for Lilly Research Laboratories

Dorothy Jean Buchanan (Ph.D., University of Cincinnati, 1951)
Enzymatic degradation of blood-group-specific substances—Lister Institute of Preventive Medicine, London, with W. T. J. Morgan.

David G. Cornwell (Ph.D., Candidate, Stanford University, 1954)
Plasma lipoproteins—Harvard University, with J. L. Oncley.

Gaylord M. Conzelman, Jr. (Ph.D., George Washington University, 1953)
Investigation of the hematotoxic moieties of certain 8-amino quinolines—Christ Hospital Institute of Medical Research, Cincinnati, with Leon H. Schmidt.

Joseph C. Shipp (M.D., College of Physicians and Surgeons, 1952)
Renal tubular mechanisms by micro-radioactive isotopic techniques—Harvard Medical School, with George W. Thorn and A. K. Solomon.

Fellowships in Tuberculosis Administered for the National Tuberculosis Association

Richard H. Shepard (M.D., Johns Hopkins University, 1946)
Estimation of oxygen tension in whole blood: Application to assessment of pulmonary function—Johns Hopkins University, with Joseph L. Lilienthal, Jr., and Richard L. Riley.

Gerard M. Turino (M.D., College of Physicians and Surgeons, 1948)
Evaluation and separation of resistive forces to lung ventilation in states of normal and abnormal pulmonary function—Columbia University and Presbyterian Hospital, with Dickinson W. Richards.

FELLOWSHIPS IN RADIOLOGICAL RESEARCH

The James Picker Foundation has made available a limited number of Fellowships in Radiological Research. The Committee on Radiology of the Division of Medical Sciences serves as the administrative and scientific advisory body to the Foundation. Upon recommendation of the Committee, the Board of Directors of the Picker Foundation has approved two awards for 1954–55. The names of the appointees, the institutions from which they received the doctorate, and the nature and location of their fellowship research are as follows:

Murray Green Smyth, Jr. (M.D., University of Pennsylvania, 1949)
Distribution and dosage of colloidal and particulate sources of radioactivity—University of Pennsylvania, with Richard H. Chamberlain.

Kakarla Subbarao (M.B.B.S., Andhra, India Medical College, 1950)
Regional ileus as a roentgenological manifestation of disease—Bellevue Hospital, New York City, with M. H. Poppel.

GRANTS FOR SCHOLARS IN CANCER RESEARCH

In addition to the fifty-two fellowship awards reported on page 48, the American Cancer Society, upon recommendation of the Committee on Growth, has awarded seven new scholar grants and three renewals. The scholar grants are to aid research institutions in employing independent investigators in cancer research as staff members. These grants provide $6,000 annually for three years to the institution as a contribution in support of the individual researcher who, it is hoped, will become a permanent staff member. The following scholars have been appointed to work at the institutions indicated:

Paul Berg (Ph.D., Western Reserve University, 1952)
Department of Microbiology, Washington University.

Frank Dituri (M.D., University of Pennsylvania, 1951)
Department of Medicine, University of Pennsylvania.

Emmanuel Farber (M.D., University of Toronto, 1942; Ph.D., University of California, 1949)
Department of Pathology, Tulane University School of Medicine (renewal for one year).

Harold R. Garner (Ph.D., California Institute of Technology, 1951)
Department of Biological Sciences, Purdue University (renewal for three years).

Charles Gilvarg (Ph.D., University of Chicago, 1951)
Department of Biochemistry, Bellevue Medical Center.

Robert D. Griesemer (M.D., Harvard University, 1943)
Department of Dermatology, Massachusetts General Hospital.

James M. Price (Ph.D., University of Wisconsin, 1949; M.D., University of Wisconsin, 1951)
Department of Clinical Pathology, University of Wisconsin.

Jesse F. Scott (M.D., Vanderbilt University, 1941)
Department of Medicine, Massachusetts General Hospital (renewal for one year).

Paul Talalay (M.D., University of Chicago, 1946)
Ben May Laboratory for Cancer Research, University of Chicago.

Jules M. Weiss (M.D., New York University, 1951)
Department of Anatomy, Washington University.

AWARD OF FELLOWSHIPS IN CANCER RESEARCH

The American Cancer Society, upon recommendation of the Committee on Growth of the Division of Medical Sciences, has awarded fifty-two fellowships in cancer research for the academic year 1954-55. Three of these are British-American exchange fellowships. The recipients of the fellowships will study in twenty-one institutions in the United States, and in eleven foreign laboratories.

The following list indicates the institution from which the appointees received the doctorate, as well as the nature and location of their fellowship research. Since the list was prepared in May 1954, some of the appointees may withdraw and their alterates be named to replace them. If so, corrections will be made in a later issue of NEWS REPORT.

Philip Aisen (M.D., Columbia University, 1953)
(1) Origins of bile pigment from sources other than the hemoglobin of mature circulating erythrocytes; (2) Metabolic behavior of various constituents of the erythrocyte—Columbia University, with Irving M. London.

Alan C. Aisenberg (M.D., Harvard Medical School, 1950)
(1) Conversion of acetate and glucose to CO_2 and investigation of the Pasteur effect; (2) Conversion of glucose to nucleoprotein ribose—University of Wisconsin, with Van Rensselaer Potter.

Joseph B. Alpers (M.D., Columbia University, College of Physicians and Surgeons, 1953)
Hydrolysis of thyroglobulin by intrinsic enzyme systems—Sloan-Kettering Institute, New York City, with Rulon W. Rawson.

Elizabeth P. Anderson (Ph.D., Stanford University, 1951)
The role of the purine and pyrimidine nucleotides in nucleic acid synthesis and transglycosidation—National Institutes of Health, with Herman L. Kalckar and Bernard L. Horecker.

Richard S. Benua (M.D., Johns Hopkins University, 1946)
The functional nature of thyroid tissues with special emphasis on radioiodine radiated thyroids and thyroid tumors—Western Reserve University, with Brown M. Dobyns.

David P. Bloch (Ph.D., University of Wisconsin, 1952)
The synthesis of desoxyribonucleic acid and histone during the course of the mitotic cycle—Columbia University, with Arthur W. Pollister.

LaRoy N. Castor, Jr. (Ph.D., Candidate, University of Pennsylvania, 1954)
Photochemical action spectrum of CO inhibited respiration—University of Cambridge, Cambridge, England, with D. Keilin.

Harold M. Davidson (Ph.D., University of Oregon, 1951)
(1) Metabolism of phosphoprotein; (2) Characterization of purified prostatic acid phosphatase—Tufts College Medical School, with Gerhard Schmidt and William H. Fishman.

George W. deVillafranca (Ph.D., Yale University, 1951)
Some biochemical and biophysical properties of the myosin proteins about the time of first contraction in embryonic mammalian muscle—Institute for Muscle Research, Woods Hole, Massachusetts, with Albert Szent-Gyorgyi.

Richard J. Doisy (Ph.D., Candidate, Syracuse University, 1954)
Protective actions of cholesterol or pantothenic acid on induced hyperthyroidism in rats—University of Wisconsin, with Henry A. Lardy.

Richard M. Franklin (Ph.D., Candidate, Yale University, 1954)
Quantitative studies on the Rous sarcoma virus—California Institute of Technology, with Renato Dulbecco.

Norbert Freinkel (M.D., New York University, 1949)
The transport of inorganic iodide—Thorndike Memorial Laboratory, Boston, with William B. Castle.

Jules A. Gladner (Ph.D., University of Washington, Seattle, 1953)
Cofactors involved in purine and nucleotide biosynthesis—Massachusetts Institute of Technology, with John M. Buchanan.

Donald P. Groth (Ph.D., Candidate, University of Wisconsin, 1954)
The use of biochemical methods in the study of growth, differentiation, and cellular physiology—Université Libre de Bruxelles, Brussels, Belgium, with J. Brachet.

Isaac M. Harary (Ph.D., New York University, 1953)
Acyl thiol ester transfer enzymes—National Institutes of Health, with Earl Stadtman.

Robert B. Hurlbert (Ph.D., University of Wisconsin, 1952)
Enzymatic mechanisms and intermediates in the biosynthesis of nucleic acids—University of Copenhagen, Copenhagen, Denmark, with Herman Kalckar and Hans Klenow.

Jerard Hurwitz (Ph.D., Western Reserve University, 1953)
The glucose-6-phosphate oxidative cycle—National Institutes of Health, with Bernard L. Horecker.

Mary Ellen Jones (Ph.D., Yale University, 1951)
The mechanism of various synthetic reactions involving energy-rich enzyme-substrate complexes—Massachusetts General Hospital and Harvard Medical School, with Fritz Lipmann.

Burke H. Judd (Ph.D., Candidate, California Institute of Technology, 1954)
The role of heterochromatic rearrangements as modifiers of the variegated-type position effect in *Drosophila melanogaster*—University of Texas, with Wilson S. Stone.

David Kahn (Ph.D., University of Chicago, 1952)
The effect of heavy ion elastic scattering and inner shell ionization on complex organic molecules—Norwegian Cancer Institute, Oslo, Norway, with Johan Baarli.

Raymond H. Kahn (Ph.D., University of California, 1953)
In vitro action of hormones on secondary sex accessories—University of California at Berkeley, with Kenneth B. DeOme.

Armin D. Kaiser (Ph.D., Candidate, California Institute of Technology, 1954)
Genetic analysis of the temperate bacteriophage "Lambda"—Pasteur Institute, Paris, France, with André Lwoff and F. Jacob.

Jane C. Kaltenbach (Ph.D., State University of Iowa, 1950)
Antigens during embryonic development—Wenner-Grens Institut, Stockholm, Sweden, with John Runnström.

Ruth Kimmelstiel (M.D., Duke University, 1951)
The utilization of carbon-14 labeled amino acid by the human placenta *in vitro*—Harvard Medical School and Boston Lying-In Hospital, with A. Baird Hastings and Claude A. Villee.

Aaron J. Ladman (Ph.D., Indiana University, 1952)
Histochemical studies of the anterior pituitary and the adrenal medulla of rodents under normal and experimental conditions—Harvard Medical School, with George B. Wislocki.

Karl G. Lark (Ph.D., New York University, 1953)
Cytological, physiological and biochemical properties of *Salmonella typhimurium* in relation to the mitotic cycle of this organism—State Serum Institute, Copenhagen, Denmark, with O. Maaløe.

Isaac Lewin (M.D., University of Pennsylvania, 1950)
Effect of steroid hormones on xanthine oxidase in normal and neoplastic tissue—Royal Cancer Hospital, London, England, with Alexander Haddow.

Sarah A. Luse (M.D., Western Reserve University, 1949)
Investigation of the histologic anatomy of the nervous system by means of electron microscopy and histochemistry—Washington University School of Medicine, St. Louis, with Edward W. Dempsey.

William S. Lynn, Jr. (M.D., College of Physicians and Surgeons, 1946)
Cholesterol catabolism—University of Pennsylvania, with Samuel Gurin.

Julius Marmur (Ph.D., Iowa State College, 1951)
Genetic studies associated with bacterial transformations—Pasteur Institute, Paris, France, with A. Lwoff and J. Monod.

Margery P. F. Marsden (Ph.D., Candidate, Harvard University, 1954)
The use of *in vitro* culture techniques as a tool in studying normal and abnormal growth in vascular plants—Harvard University, with Ralph H. Wetmore.

Harold T. Meryman (M.D., Long Island Medical School, 1946)
Study of the genetic components of hydrated micro-organisms in the solid state by particulate and electromagnetic radiations—Yale University, with Ernest C. Pollard.

Joseph F. Migliarese (Ph.D., Candidate, Rutgers University, 1954)
Chemicarcinogenesis: tumor-host relations—University of Kansas, with Robert E. Stowell and Chauncey G. Bly.

Matthew W. Noall (Ph.D., University of Utah, 1952)
Mode of production of endocrine influences upon nitrogen metabolism—Tufts College Medical School, with H. N. Christensen.

Carl R. Partanen (Ph.D., Candidate, Harvard University, 1954)
Comparative quantitative determinations of nucleic acids in organized and unorganized plant growth *in vitro*—Columbia University, with Arthur W. Pollister.

David M. Prescott (Ph.D., Candidate, University of California, 1954)
The role of the nucleus in interphase activities of the cytoplasm of amoeba proteus—Carlsberg Laboratories, Copenhagen, Denmark, with Heinz Holter.

Howard V. Rickenberg (Ph.D., Candidate, Yale University, 1954)
The nature of the induction process in the formation of induced enzymes and interactions between enzyme-forming systems—Pasteur Institute, Paris, France, with Jacques Monod.

Robert M. Rosenbaum (Ph.D., Harvard University, 1953)
In vivo study of the phagocytic blood elements in the normal state and in shock—Beth Israel Hospital, Boston, with Jacob Fine.

Harry Rubin (D.V.M., New York State College of Veterinary Medicine at Cornell University, 1947)
The life cycle of the Rous sarcoma virus—California Institute of Technology, with Renato Dulbecco.

Kenneth J. Ryan (M.D., Harvard Medical School, 1952)
Mechanisms in enzymatic reactions—Massachusetts General Hospital, with Fritz Lipmann.

Seaward A. Sand (Ph.D., Candidate, Cornell University, 1954)
Somatic mutation and chronic irradiation—Brookhaven National Laboratory, Upton, N. Y., with Arnold H. Sparrow.

Robert B. Schultz (M.D., Yale University, 1952)
Tumor-virus relationships — Harvard Medical School and The Children's Hospital, Boston, with John F. Enders.

Stanley K. Shapiro (Ph.D., University of Wisconsin, 1949)
Genetic control of enzyme formation—Yale University, with David M. Bonner.

James E. Smith (Ph.D., Candidate, Purdue University, 1954)
The molecular architecture of the cell walls of *Penicillium chrysogenum* Q176—Purdue University, with Henry Koffler.

Jacob Straus (Ph.D., University of Michigan, 1953)
Factors affecting the rooting response of excised cotyledons of red and black radish—Harvard University, with Kenneth V. Thimann.

A. Raymond Terepka (M.D., University of Rochester, 1951)
Clinical and metabolic observations during forced-feeding of cancerous patients—University of Rochester, with E. Henry Keutmann and Christine Waterhouse.

Richard S. Thomas (Ph.D., Candidate, University of California, Berkeley, 1954)
Function and intracellular localization of macromolecules of rat liver cell homogenates—Carlsberg Laboratories, Copenhagen, Denmark, with Heinz Holter.

Katharine Tryon (Ph.D., University of Michigan, 1953)
Comparative physiological studies of differentiating and non-differentiating tobacco tissue *in vitro*—University of Wisconsin, with Folke Skoog.

John E. Whitney (Ph.D., University of California, Berkeley, 1951)
The influence of pituitary hormones on growth and metabolism—University of Cambridge, Cambridge, England, with F. G. Young.

British American Exchange Fellowships in Cancer Research

Seymour Gelfant (Ph.D., University of Wisconsin, 1953)
In vitro studies of the growth effects of gonadal hormones on sexual and non-sexual tissues—University of London, London, England, with W. S. Bullough.

Gerald D. Shockman (Ph.D., Rutgers University, 1952)
Some aspects of amino acid and protein synthesis by living micro-organisms—Oxford University, Oxford, England, with D. D. Woods.

Edith L. Smith (Ph.D., University of Rochester, 1949)
The reactions of the cytochrome system—University of Cambridge, Cambridge, England, with D. Keilin.

RECORD OF MEETINGS

March

1 — Committee on Growth, Executive Committee

2 — Subcommittee on Personnel and Training
Committee on Tables of Constants and Numerical Data, Nuclear Data Group

3–4 — Committee on Packing, Packaging and Preservation, *Chicago*

5 — Committee on Latin America, *New York City*
Highway Research Board, Preliminary Conference on Urbanization Research

6 — Medical Fellowship Board

8 — Institute of Animal Resources
Subcommittee on the Cutaneous System

9 — Subcommittee on Hand Functioning and Handwear

12 — RCA Fellowship Board

13 — National Research Council Postdoctoral Fellowship Board

15 — Subcommittee on Waste Disposal

16 — Committee on Sanitary Engineering and Environment
Subcommittee on Shock and Panel on Plasma, Joint Meeting
Panel on Malaria

17 — Subcommittee on Shock and Subcommittee on Trauma, Joint Meeting
Building Research Advisory Board, Executive Committee

18 — Committee on Construction and Use of Precise Globes and Spherical Maps

March

19 Operating Committee, Federal Construction Council

21 Academy–Research Council Fellowship Policy Board

22–23 Symposium on Atherosclerosis

Biology Council, Committee on Educational Policies

Biology Council

24 Subcommittee on Cardiovascular Systems

Advisory Committee on International Technological Assistance

25 Panel on Titanium

Committee on Flame and Thermal Protective Combat Clothing, *Philadelphia*

26 Committee on Radiation Cataracts, Fifth Conference

Operating Committee, Federal Construction Council

29 Ad hoc Committee on Fellowship Taxation

30 Committee on Tables of Constants and Numerical Data, Nuclear Data Group

Committee on Medicine and Surgery

31 Symposium on Laboratory Propagation and Detection of the Agent of Hepatitis, *New York City*

April

2 Division of Anthropology and Psychology, Executive Committee

Division of Anthropology and Psychology, Annual Meeting

3 Committee on Atomic Casualties

5 Committee on International Relations in Anthropology, Subcommittee on Finance, *Philadelphia*

5–6 Highway Safety Research Correlation Conference

6 Advisory Committee on Artificial Limbs

7 Maritime Cargo Transportation Conference, Steering Committee

Panel on Sterilization of Blood and Plasma

8 Committee on the Purity of Chemical Products

Food and Nutrition Board, Executive Committee

9 Division of Engineering and Industrial Research, Executive Committee

9–10 Food and Nutrition Board

10 U. S. National Committee, International Union against Cancer, Program Panel, Joint Meeting, *Atlantic City, N. J.*

11 American Geological Institute, Board of Directors, *St. Louis, Mo.*

April

12 Division of Chemistry and Chemical Technology, Executive Committee

13 Committee on Tables of Constants and Numerical Data, Nuclear Data Group

16 Ad hoc Coral Atoll Advisory Group

Ad hoc Committee on Fellowship Taxation

19 Committee on Problems of Alcohol

20 Committee on Development of Substitutes for Waterfowl Feather and Down, *Philadelphia*

Committee on Veterans Medical Problems

Subcommittee on Nuclear Reactors

21 Academy–Research Council Panel on Blood Coagulation and the Canadian Defense Research Board Panel on Coagulants and Anticoagulants, Joint Meeting, *Toronto*

Committee on Wool-Type Fabrics and Blends, *New York City*

22 Subcommittee on Dairy, Oil and Fat Products, *Chicago*

Subcommittee on Oncology

Committee on Wool-Type Fabrics and Blends

Subcommittee on American Registries of Pathology

22–23 Highway Research Board, Committee on Urbanization Research

22–25 Committee on Growth, Section on Fellowships, *Harriman, N. Y.*

23 Committee on Pathology

23–24 Committee on Disaster Studies, *New York City*

24 Subcommittee on Program for International Congress of Anthropological and Ethnological Sciences, *Evanston, Ill.*

25 National Academy of Sciences–National Research Council, Governing Board

Council of the National Academy of Sciences

26 Committee on Growth, Executive Committee, *Princeton, N. J.*

26–28 National Academy of Sciences, Annual Meeting

27 Symposium on Moisture Relationships Affecting Wheat and Its Milled Products, *Chicago.*

29 Ad hoc Subcommittee to Evaluate the Armed Forces Food Research and Development Program

American Institute of Biological Sciences, Publications Committee

Subcommittee on Water Supply

29–May 1 Division of Earth Sciences, Annual Meeting, Executive Session and General Session

NEW PUBLICATIONS

Annual Report of the Conference on Electrical Insulation. 1953 Meeting. Academy–Council Publication No. 304. 1954. 46 p. $3.00.

Basic Mechanisms in Radiobiology. II. Physical and Chemical Aspects. Academy–Council Publication No. 305. 1953. 145 p. $1.00.

Control of Tooth Decay. Food and Nutrition Board. National Research Council. 1953. 18 p. 1-5 copies, $0.20 each; 6-50, $0.10 each; over 50, $0.05 each.

Directory of Geologists and Exploration Geophysicists in Member Societies of the American Geological Institute. American Geological Institute Report No. 10. Academy–Council Publication No. 308. April 1954. 411 p. $2.50.

Experiment in Extension Programs for County Highway Engineers. Highway Research Board Bulletin No. 85. Academy–Council Publication No. 299. 1953. 15 p. $0.30.

Nutrient Requirements for Foxes and Minks. Nutrient Requirements for Domestic Animals No. VII. Academy–Council Publication No. 296. 1953. 30 p. $0.50.

Parking as a Factor in Business. Highway Research Board Special Report No. 11. Academy–Council Publication No. 273. 1953. 321 p. $6.00.

Parking Meters: Their Number, Revenue and Use. Highway Research Board Bulletin No. 81. Academy–Council Publication No. 291. 1953. 128 p. $1.35.

Porcelain Enamel in the Building Industry. Building Research Advisory Board Conference Report No. 6. Academy–Council Publication No. 303. 1954. 146 p. $6.00.

Problem of Providing Optimum Fluoride Intake for Prevention of Dental Caries. Academy–Council Publication No. 294. 1953. 15 p. $0.50.

Proceedings Second Annual Meeting, Agricultural Research Institute, November 23–24, 1953. National Research Council. [1954]. 56 p.

Recommended Dietary Allowances, Revised 1953. Academy–Council Publication No. 302. 1953. 36 p. $0.50.

Roadsides: Their Use and Protection. Highway Research Board Special Report No. 17. Academy–Council Publication No. 290. 1954. 48 p. $0.75.

Roster of Disaster Personnel. Disaster Research Clearinghouse Report No. 1. National Research Council. January 1954. 51 p.

Survey of Food and Nutrition Research in the United States of America, 1952–1953. Prepared by Food and Nutrition Board, National Research Council under contract with U. S. Department of Agriculture. Washington, Government Printing Office, April 1954. 372 p. $1.75.

Symposium on Microseisms, held at Arden House, Harriman, N. Y., 4–6 September 1952. Academy–Council Publication No. 306. December 1953. 125 p. $1.00.

United States Government Grants under the Fulbright Act: University Lecturing. Advanced Research. Academic Year 1955–1956. Conference Board of Associated Research Councils. Committee on International Exchange of Persons. 1954. 23 p.

WASHO Road Test. Part I: Design, Construction, and Testing Procedures. Highway Research Board Special Report No. 18. Academy–Council Publication No. 310. 1954. 121 p. $2.25.

Notice of Academy Meetings

NATIONAL ACADEMY OF SCIENCES

Autumn Meeting, Columbia University, November 8-10, 1954
Annual Meeting, Washington, D. C., April 25-27, 1955

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL

Governing Board, Washington, D. C., June 20, 1954

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